

1 WHAT IS CLAIMED IS:

5

1. A device comprising:

a chip;

a resin package sealing said chip, said
resin package having resin projections located on a
mount-side surface of the resin package;

10 metallic films respectively provided to the
resin projections; and

connecting parts electrically connecting
electrode pads of said chip and the metallic films.

15

2. The device as claimed in claim 1,

20 wherein each of said metallic films is a single layer
made of a metallic substance.

25

3. The device as claimed in claim 1,
wherein each of said metallic films comprises a
plurality of metallic layers which are stacked.

30

4. The device as claimed in claim 1,

connecting parts respectively comprise
said metallic films.

1 116 337
5. The device as claimed in claim 1,
wherein:

said connecting parts respectively comprise
bonding wires, and bonding balls respectively provided
5 to the metallic films; and

said bonding wires are bonded to said
electrode pads and said bonding balls.

10

6. The device as claimed in claim 1,
wherein said resin package is a molded package so that
the resin projections are integrally formed.

15

116 337
7. The device as claimed in claim 1,
20 wherein said resin package includes a first resin
portion on which the chip is provided, and a second
resin portion which covers the chip.

25

8. The device as claimed in claim 7,
wherein:

said connecting parts respectively comprise
30 bonding wires, and connection electrodes which are
provided on said first resin portions and extend, into
the resin projections, to the metallic films; and
said bonding wires are bonded to the

1 9. The device as claimed in claim 8,
wherein said resin projections respectively have
through holes through which the connection electrodes
extend to the metallic films.

5

sub 7
CH 10 10. A device comprising:
a chip;
a resin package sealing said chip and having
a first resin portion and a second resin portion, said
chip being provided on said first resin portion and
covered by said second resin portion;
15 connecting parts having bonding wires and
connection electrodes, said connection electrodes
being provided on the first resin portion and
projecting therefrom; and
metallic films respectively provided to the
20 connection electrodes of said connecting parts.

25 11. A device comprising:
a chip;
a resin package sealing said chip and having
a first resin portion and a second resin portion, said
chip being provided on said first resin portion and
30 covered by said second resin portion, the first resin
portions having through holes;
electrode parts provided to said first resin
portion so as to respectively cover the through holes;

2 said chip and said electrode parts.

1 12. The device as claimed in claim 11,
wherein said first resin portion comprises a resin
tape.

5

 13. The device as claimed in claim 11,
wherein said connecting parts respectively comprise
10 bonding wires, which are bonded to the electrode pads
and the electrode parts.

15

14. A device comprising:
a chip;

a resin package sealing said chip, said
resin package having resin projections located on a
20 mount-side surface of the resin package, said resin
projections extending downwards from the mount-side
surface and laterally extending from at least one side
surface of the resin package;

metallic films respectively provided to the
25 resin projections; and

connecting parts electrically connecting
electrode pads of said chip and the metallic films.

30

15. The device as claimed in claim 14,
wherein each of said metallic films is a single layer
made of a metallic substance.

1 16. The device as claimed in claim 14,
wherein each of said metallic films comprises a
plurality of metallic layers which are stacked.

5

17. The device as claimed in claim 14,
wherein said connecting parts respectively comprise
10 bonding wires, which are bonded to the electrode pads
and said metallic films.

15

18. The device as claimed in claim 14,
wherein:
said connecting parts respectively comprise
bonding wires, and bonding balls respectively provided
20 to the metallic films; and
said bonding wires are bonded to said
electrode pads and said bonding balls.

25

19. The device as claimed in claim 14,
wherein said resin package is a molded package so that
the resin projections are integrally formed.

30

20. The device as claimed in claim 14.

Continued on Side 90

B37
21. The device as claimed in claim 14,
wherein said resin projections laterally extend from
only one side surface of said resin package.

5

22. The device as claimed in claim 20,
further comprising supporting members provided to said
10 resin package, said supporting members supporting the
device vertically mounted on a circuit board.

15

23. A device comprising:
a chip;

a resin package sealing said chip, said
resin package having resin projections located on a
20 mount-side surface of the resin package, said resin
projections extending downwards from the mount-side
surface and being substantially flush with a side
surface of the resin package;

metallic films respectively provided to the
25 resin projections; and

connecting parts electrically connecting
electrode pads of said chip and the metallic films.

30

24. The device as claimed in claim 23,
wherein:

said resin projections comprise first

second resin projections; and
projections extend below the chip; and

1 said metallic films comprise first metallic
films provided on the first projections, and second
metallic films provided on the second projections.

5

25. The device as claimed in claim 23,
further comprising a spacer to be provided to the
10 mount-side surface of said resin package, wherein said
spacer is in contact with another device when said
device is supported on a circuit board so that said
side surface of the resin package faces the circuit
board.

15

26. The device as claimed in claim 25,
20 wherein said spacer is a heat radiating member.

27. A method of producing devices
25 respectively having chips sealed by resin packages,
said method comprising:

(a) forming a lead frame having a base
having recess portions respectively having metallic
30 films;

(b) mounting chips on the lead frame;

(c) providing connecting parts which
electrically connect electrode pads of said chips and
the metallic films;

enclosed respectively over the said metallic films
films supported by the lead frame; and

1 (e) separating from the lead frame the
molded resin packages together with the metallic films
provided to resin projections which are counterparts
of said recess portions.

5

28. The method as claimed in claim 27,
10 wherein said step (e) comprises a step of etching the
lead frame and thereby dissolving the lead frame.

15

29. The method as claimed in claim 27,
wherein said step (e) comprises a step of mechanically
separating the lead frame from the molded resin
packages and the metallic films.

20

30. The method as claimed in claim 27,
25 further comprising a step of providing a tape member
to the molded resin packages before said step (e) is
executed.

30

31. The method as claimed in claim 27,
wherein said step (c) comprises a first step of
providing bonding balls to the metallic films and a
second step of providing bonding wires to the chip and said bonding balls and said bonding wires
and said bonding wires corresponding to said

1 connecting parts.

5

32. The method as claimed in claim 27,
wherein said step (d) molds the resin so that the
molded resin packages are joined together.

10

33. The method as claimed in claim 27,
wherein said step (d) molds the resin so that the
15 molded resin packages are separated from each other.

20

34. A device comprising:
a chip;

a resin package sealing said chip, said
resin package having a mount-side surface of the resin
package;

25

metallic films respectively provided in the
resin package so that the metallic films are flush
with the mount-side surface and are exposed therefrom;
and

connecting parts electrically connecting
30 electrode pads of said chip and the metallic films.

WHEREFORE

said connecting parts respectively comprise

1 bonding wires, and bonding balls respectively provided
to the metallic films; and

said bonding wires are bonded to said
electrode pads and said bonding balls.

5

36. The device as claimed in claim 34,
10 wherein each of said metallic films is a single layer
made of a metallic substance.

15

37. The device as claimed in claim 34,
wherein each of said metallic films comprises a
plurality of metallic layers which are stacked.

20

38. The device as claimed in claim 34,
wherein said connecting parts respectively comprise
25 bumps provided between the electrode pads of the chip
and the metallic films.

30

39. A method of producing devices
respectively having chips sealed by resin packages,
said method comprising:

(a) forming a resin frame having a central opening

(b) mounting chips on the resin frame

(c) providing connecting parts which

1 electrically connect electrode pads of said chips and
the metallic films;

(d) molding resin so that molded resin
packages respectively cover the chips and metallic
5 films supported by the lead frame; and

(e) separating from the lead frame the
molded resin packages together with the metallic films
so that the chips are exposed from mount-side surfaces
of the molded resin packages.

10

40. The method as claimed in claim 39,
15 wherein said step (e) comprises a step of etching the
lead frame and thereby dissolving the lead frame.

20

41. The method as claimed in claim 39,
wherein said step (e) comprises a step of mechanically
separating the lead frame from the molded resin
packages and the metallic films.

25

42. The device as claimed in claim 1,
30 wherein:

said metallic films respectively have lead
portions, which are sealed by the resin package and
extend toward the chip; and

said connecting parts include bonding wires

1 43. The device as claimed in claim 42,
further comprising a heat radiating member sealed by
the resin package, the chip being provided on said
heat radiating member.

5

10 44. The device as claimed in claim 1,
wherein:

said connecting members respectively
comprise bumps provided between the electrode pads of
the chip and the metallic films.

15

45. The device as claimed in claim 1,
wherein:

20 said metallic films respectively have lead
portions, which are sealed by the resin package and
extend toward the chip; and

25 said connecting parts include bumps provided
between the electrode pads of the chip and the lead
portions of the metallic films.

30 46. The device as claimed in claim 1,
wherein:

said metallic films respectively have lead
portions, which are sealed by the resin package and
extend toward the chip;

and connecting parts including bumps
are positioned in said recess portions and are

138 1
1007
provided between the electrode pads of the chip and the lead portions of the metallic films.

5

47. The device as claimed in claim 44, wherein a back surface of the chip opposite to a surface on which the electrode pads are provided is exposed from a surface of the resin package opposite to the mount-side surface thereof.

15

48. The device as claimed in claim 47, further comprising a heat radiating member attached to the back surface of the chip.

20

49. The device as claimed in claim 44, further comprising an insulating member provided to a surface of the chip on which the electrode pads are provided.

30

50. The device as claimed in claim 44, wherein said connecting parts comprise an electrically conductive resin containing conductive particles